

**Guide 1.13**

**Control Account Planning and Analysis (DRAFT Rev 1)**

**1.0 Purpose**

This guidance describes the sequence of activities and responsibilities of the Control Account Manager (CAM) in control account planning which includes development and maintenance of the Control Account Plan. Monitoring, statusing, and analysis of performance against Control Account Plan will create awareness of potential problem areas and synergize solution development by facilitating team communications.

This guidance also addresses the methodology to be utilized to issue Control Account Plans for review, approval, and implementation for controlling changes.

**2.0 Scope**

This guidance applies to all projects which are executed in accordance with the Project Management and Control process as determined by Procedure 2.11- "Project Baseline Development", Manual E11.

**3.0 Terms/Definitions**

(See Terms, Definitions and Acronyms)

**4.0 General**

**A. Control Account Manager**

The specific level for Control Account Manager assignments is determined by the integration between the WBS and the OBS which is driven by the project and risk associated with specific scopes of project work. The Control Account Manager may or may not be the performing manager for the control account. However, a control account can only have a single responsible manager; CAM.

The CAM is responsible for:

- Executing the Statement of Work associated with his/her assigned Control Account(s).
- The detailed planning and performance.
- The technical quality of the work performed within his/her assigned Control Accounts.

The CAM is assigned to a Control Account to monitor cost and schedule performance of a significant element of the work. A Control Account is a management control point for:

- Cost Summarization
- Schedule and Milestone Control
- Variance Analysis and Reporting
- Responsibility Assignment
- Scope Control
- Corrective Action Planning

**B. Schedule and Earned Value Reporting**

The Project's Resource-Loaded Detail Schedule reflects the Project's Performance Measure Baseline (PMB). The detail schedule is the anchor for the project's control account planning and reporting – formulating the BCWS and BCWP for the current reporting period and the cumulative.

The scheduling baseline depicts the BCWS for the current and cumulative periods. During the normal course of schedule statusing, the work/task packages will accumulate to provide the control accounts BCWP (cumulative and current periods). The current and cumulative thresholds, as defined by the Project Execution Plan (PEP) and/or Team Execution Plan (TEP), highlight the control accounts which require variance analysis. If the Project Team selects the use of a cost processor for EVM reporting, the schedule data should link to the cost processor to provide the BCWS and BCWP; automatically or manually. Generally, the Project's detail schedule will provide a better explanation for the current progress of the work/task packages as opposed to the cost processor. In the schedule the work/task package is represented by several activities while the cost processor may represent a single activity for a particular work/task package.

#### **C. Control Accounts**

All aspects of the SRS Project Management Controls System (PMCS) interface at the control account, including budgets, estimates, identification of work scope, variance analysis and corrective action plans. This is a management reporting point at which actual direct labor, material or other direct costs can be accumulated and compared to the BCWS and BCWP.

#### **D. Work Packages**

Work packages that can be logically grouped together and assigned to a specific individual, Control Account Manager (CAM) for management are combined and planned into control accounts to the greatest extent possible.

Work Packages (WP) contain a discrete segment of work below the Control Account level that is defined by:

- a description or brief work statement
- starting and ending dates
- completion milestone
- work-in-process measure
- time-phased budget expressed in direct labor (hours and/or dollars), material, other direct costs and subcontract dollars

Discrete effort has a clearly definable start and completion dates and for which an earned value technique can be used for performance measurement, generally used is the Milestone technique.

Work Packages, also, can be categorized by Apportioned Effort and Level of Effort (LOE). Apportioned effort is dependent upon or related in direct proportion to the performance of other work. While LOE is a support effort that is not easily measured in terms of discrete accomplishment, but sustained activity over a period of time. Tasks should be identified to discrete efforts as much as possible to minimize those categorized as LOE, as performance can only be measured as a direct ratio of the expenditure of the effort.

It is important that the duration of a Work Package be a relatively short span of time (normally, but not limited to, six months or less).

In certain cases, however, tasks have been outlined to the greatest extent possible but cannot be subdivided into control accounts or assigned to specific individual CAMs. These groupings of tasks are called planning accounts.

#### **E. Planning Accounts and Planning Packages**

Future work within a control account which cannot be subdivided into detail work packages should be identified in larger planning packages for purposes of budgeting and scheduling.

Planning packages differ from work packages in the following ways:

- The time-phasing of the budget may be linear spread over the assumed duration of the planning package or be a lump sum value this is spread.
- Detailed resource codes showing all the resources which are assumed to be necessary to complete the planning package do not have to be displayed and the planning package budget may be expressed simply in terms of the manhours and/or dollars required.
- No earned value technique will be designated.

The budget should be identified according to the work for which it is intended, be time-phases and be controlled to prevent its use in the performance of other work. In fact, the planning package budget may be time-phased over the entire period of their planned performance, or may simply be assigned to a single period within the fiscal year. Before work contained in a planning package is begun, the planning package must be converted to a work package so that performance measurement can be accomplished. All work in planning packages should be planned to the appropriated level of detail for work/task packages at least six months prior to the scheduled start of work.

A. Performance Measurement Baseline (PMB)

A time-phased budget plan is created which is referred to as the Control Account Plan (CAP). The CAP is established by the scheduling and by assigning applicable budgets of the project scope at the control account level or below. The sum of all CAPs plus the planning accounts and any Undistributed Budget established the Performance Measurement Baseline (PMB). The PMB does not include any contingency.

B. Undistributed Budget (UB)

Budget applicable to the project but not assigned to both a functional Organization and WBS element is referred to as UB. This budget should be formally be allocated to control accounts within 90 days and prior to work starting to maintain the integrity of the PMB. Until this allocation is made and included in the appropriate control account plan, the UB will remain unscheduled and only be included in the total PMB, Budget At Completion (BAC) and Estimate At Completion (EAC). Usually, the establishment of the UB will occur when contract changes are authorized and reporting deadlines preclude the planning of newly authorized work has not yet been negotiated.

## 5.0 Control Account Planning, Budgeting and Work Authorization

Control account planning, budgeting and work authorization refers to those activities that culminate in establishing the Performance Measurement Baseline (PMB) for a project and in authorizing the functional organization to perform the work associated with the PMB. . Control account planning and budgeting is a recurring process, throughout the life of the project during each project phase. The process of authorizing the specific project scope occurs when the Project Manager receives the appropriate authorization documents from DOE and the WSRC Controller Organization. Once the CAM receives this authorization from the Project Manager, the Control Account Plans are finalized. However, external reporting does not occur until a project has established a single-point estimate value.

A. Control Account Planning

Control account planning establishes the Control Account Budget for a functional organization to perform the associated work when authorization is provided. This section is intended to provide the CAM with the guidance of the required tools and knowledge to adequately implement control account planning.

B. Project Work Breakdown Structure (PWBS)

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The PWBS is referencing the executable level of the WBS, below Level 3 of the Site WBS which is not controlled by DOE. The Project Work Breakdown Structure (PWBS) is the primary tool for control account planning, ensuring integrated cost and schedule control. The Project WBS begins at the Line Item level (Site WBS level 3) and will account for the TEC for both projects, PED and Construction, the OPC. DOE has the prerogative to define the first 3 levels of the Site WBS.

The Project WBS provides a multi-level structure for analyzing the project at varying degrees of detail. It is the roadmap for analyzing the project progress and performance. A properly defined WBS also provides that each element of the structure at each level is the responsibility of an individual who has management authority over that element. The WBS must contain the full scope of the project. Otherwise, the information generated will not represent the total project.

The Project WBS is organized along the phase, product or commodity lines of the project; providing the framework for identifying the project commodities and components. Each should be assigned to one element in the PWBS. At the lower detail levels this will produce the first cut of the project schedule of activities.

The change control process must be followed to authorize any revisions, additions, or deletions to the Project WBS. The Project Execution Plan (PEP) will identify what level of change control approval is required before the CAM can implement the requested WBS change.

C. Project WBS, PWBS Index and Dictionary

The PWBS is usually presented in chart form. It has boxes and lines used to describe work elements and their hierarchical relationships to each other. It can also be presented in tabular fashion, which is the WBS Index. The PWBS is supplemented by a PWBS Dictionary, which provides a more detailed work scope definition for each element than is possible in either the chart or tabular format. At this point, the Control Account Numbers have been developed and are to be maintained by Project Controls. It is recommended, that Project Controls create and maintain a wall chart for the project graphically displaying the PWBS structure down to the work package level; color coded to indicate control account/work package status (active versus non-active).

D. Responsibility Assignment Matrix (RAM)

Before project authorization, the Project Manager with the concurrence of the functional organization managers use the WBS and the WSRC OBS to designate responsibilities for managing the work scope that must be initiated at the time the project is authorized (CD-0).

These responsibility assignments are specified and distributed using a document called the Responsibility Assignment Matrix. Assigning each lowest-level or terminal element in the WBS to a manager responsible for its execution results in a control point. This is a control account and the person assigned responsibility for the control account is a Control Account Manager (CAM).

The CAM initiates control Account planning at the time the Responsible Assignment Matrix (RAM) is approved by the Project Manager.

E. Organizational Breakdown Structure (OBS)

The OBS is structured in layers of management and functions that identify the members of the Project Team. It is a functionally oriented pyramid-like structure indicating organizational relationships. It uses as the framework for the assignment of work

responsibilities. The highest level of the OBS is the most senior level management of the organization while the lowest level of the OBS is the responsible individual for performing the task; the CAM. It relates to the WBS in that compatible or corresponding levels of each structure normally having similar degrees of authority and work responsibility. The OBS identifies the functional organization and individuals responsible for accomplishing the work, down to the control account level.

Changes to the OBS are made by the appropriate Human Resource Operations group. The Headcount Report is issued by the Controller organization on a monthly basis, which incorporates those changes.

**F. Detail RAM**

An Indentured table in tabular form, displaying from the control account level to the activity code level; this portrays the control account's cost accumulation path. The format of this document should be organized by control account and then by work package. The following are is recommended for content:

- Ø Control account data
  - Control account number
  - Control account title
  - Control account manager's Name
  - Control account manager's functional organization
  - Control account Budget At Completion (BAC)
  - Control account schedule dates – Start and Finish dates
- Ø Work package data (if applicable)
  - Work package number
  - Work package title
  - Work package (BAC)
  - Work package schedule dates – Start and Finish dates
- Ø Cost activity code data
  - Cost activity code number
  - Cost activity code title
  - Cost activity code BAC
  - Cost activity code schedule dates – Start and Finish dates

**G. Earned Value Techniques and Accumulation**

Earned value accumulation refers to a process to gather Budget Cost for Work Performed (BCWP) information that measures the physical accomplishment of work in terms of the planned (budgeted) cost of work.

The primary problem encountered in accumulating BCWP occurs when work is still in-process and a determination must be made about how much of the budget should be associated with the completed portion of the work. The assessment should be made objectively as possible and the process should be simple for the CAM to administer. Finally, the status cutoff point and basis for accumulating earned value credit should be in consonance with timing and basis used for recording the actual costs. It is also, important to note that retroactive changes to BCWP are prohibited. All BCWP modifications, including error corrections, are made to current period data.

When CAPS are prepared, an earned value technique is applied to each work package. It is important for the CAM to distinguish and select the technique which applies to a particular work package.

- 1) Objective Measurement of Earned Value is accomplished by using various earned value techniques that define how in-process BCWP credit is earned before the work is complete. These Milestone Earned Value techniques are valuation formulas for assessing BCWP status. These are the most acceptable earned value techniques because they identify discrete tasks. However, the duration of the work package should be considered when selecting a milestone technique.
  - a) 0/100: 100% of the budget value is earned upon completion of the tasks.
  - b) 25/75: 25% of the budget value is earned upon start of the task, and 75% of the budget value is earned upon completion of the task.
  - c) 40/60: 40% of the budget is earned upon start of the task, and 60% of the budget is earned upon completion of the task.
  - d) 50/50: 50% of the budget is earned upon start of the task, and 50% of the budget is earned upon completion of the task.
  - e) Milestone Weights: This technique allows the work package to earn budget value at the value designated for each milestone. This technique is applied to a work package with duration of several reporting periods; greater than three months. Progress payment for Engineered Equipment vendor is an example.
- 2) Less Objective Measurements of Earned Value are as follows:
  - a) Percent Complete: Budget value is earned based on the percent complete determined by the user. Where appropriate, it is supported by a Units Complete technique, in which actual units complete are compared to the total forecasted units to derive an objective measurement of percent complete.
  - b) Level of Effort: Monthly budget value is earned with the passage of time and is equal to the monthly scheduled amount.
  - c) Apportioned Effort: Budgeted value is earned for one element based on the relationship with another element, e.g., applying the same percent complete to one work package based on the percent complete established for a related work package.
  - d) BCWP Entry: Earned budget value entered as a lump sum for the period. Where appropriate, it is supported by a Units Complete technique.
- 3) BCWP for Work Packages Cancelled before Completion

Occasionally, work will be cancelled due to DOE directives or BCP actions. In such cases, BCWP credit is updated to reflect current performance status and an adjustment is made in the current period to make cumulative BCWS and BAC equal to cumulative BCWP. Any future periods is deleted and credited to Project Contingency. These actions will remove the possibility of skewing the project's schedule variance and indices; creating "artificial variances".

#### 4) Cost Collection

Project costs are collected, at a maximum, at the WBS terminal level, the lowest level of the project WBS with a unique cost activity code. If the project team deems necessary, cost can be collected at a lower level. The Project Execution Plan (PEP) and/or the Team Execution Plan (TEP) will indicate the level in which costs are to be collected. This allows the CAM to "roll-up" all the cost elements to a control account level or a work

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package level, while allowing the Project Manager to “roll-up” all cost elements to a project level.

Although cost collection is the responsibility of the WSRC Controller organization and Project Controls monitors the project's ACWP, the CAM needs to have some familiarity with the financial systems to monitor the control account.

- a) Direct Costs are costs of labor, material, subcontract and equipment directly involved in the physical construction of a permanent facility. Actual costs are automatically posted in various application systems and are fed to IBARS.
- b) Indirect Costs are costs which do not become a final part of the installation, but which are required for the orderly completion of the installation and may include, but are not limited to, field administration, direct supervision, capital tools, start-up costs, contractor's fees, insurance, taxes, etc. Indirect costs are collected in pools which are established and managed. Indirect costs are categorized as either, General & Administrative (G&S), Essential Site Services (ESS), Business Unit Overhead, Department Overhead, or Service Centers. Indirect costs are distributed to projects through an allocation process by applying recovery rates based on a proportionate allocation base. (See CFOD-BMR-PR4.55)

5) Cost Activity Codes

a) General

The CAM has several options in planning the work packages. These options depend on the nature of the control account scope, the level of detail required to define the scope, the number of resource types (or craft) involved, and the level of cost segregation necessary to analyze performance.

Cost Activity Charge Codes are identified by the CAM to direct the level of actual labor and material cost collection and may be used to relate the actual costs (ACWP) to budgeted cost (BCWS) planned for the work packages in the control account. The CAM obtains the Cost Activity Charge Codes from Project Controls to avoid duplication.

Criteria that should be considered when defining cost activity charge codes:

- Represent a defined scope, work or service, very similar to a WBS element.
  - Unique to a single terminal WBS element.
  - work related and not tied to fiscal year
  - Collect actual costs, and should have a purpose for that collection
  - Common usage is to support cost analyses and preparing EACs
  - The scope of work for the cost activity code is of sufficient size that a reasonable amount of cost is collected
- b) Cost categories (labor, equipment, subcontract, material) should be segregated, as well as, direct and indirect charges.
    - (1) Direct Charges – labor, equipment, subcontract, material
    - (2) Indirect Charges – These codes will be constant for the entire project.  
Example: Training, Safety Meetings, etc.
  - c) Activity Charge Code Structure

The development of an Activity Code Structure should consider the following:

- (1) the level at which costs are collected for a defined scope of work
- (2) able to receive costs from any site organization and cost element
- (3) projects have the ability to close an activity code to specific types of charges
- (4) can be at the control account level if desired by the project team

⇒ Example - Labor only selection will not allow material or contract costs to post against the activity code.

- d) Budget Rates added to control account and not at the work package level.

#### H. Engineering and Construction Subsystem Interfaces

Engineering and Construction work packages shown in the Control Account Plans generally are summaries of engineering and construction efforts that are detail planned and monitored in another database. The Engineering Work Management System (EWMS) efficiently supports Engineering management and project teams in performing their scopes of work (See E7-1, DE-EW Engineering Work Management System). The Quantity Unit Rate Reporting database effectively supports Construction management and project teams in the performance of their scopes of work (See 1E6, CMP-09-4.10 Performance Measurement for Direct Hire Labor).

#### I. Subcontract and Materials Planning and Statusing

Initial planning for subcontracts and material items (Engineered Equipment or Field/Bulk Materials) should be entered in the CAP as planning packages at the value and schedule carried in the latest approved project cost estimate and schedule. As subcontracts or material contracts are placed, the planning package is converted to a work package. The cost difference between the work package/planning package budget and the negotiated cost of an item at the time of contract placement may be modified through the use of contingency. The work package is planned using the negotiated contract value distributed consistent with these items are costed.

The budget for single-payment-type material contracts should be planned to occur at the point of receipt and acceptance, not at the point of delivery to receiving docks or at the point of paying the invoice. Progress-payment-type contracts should be planned consistent with the scheduled events on which payment will be based. Field materials should be planned to occur at the point in which the material is withdrawn from stores, coinciding with the timeframe in which the materials are costed.

Each significant subcontract and materials item is planned as an individual work package in the appropriate control account. The control account number, cost activity code/cost element code and Type of Work Category number ensures that actual costs for these contracts are collected and transferred to the appropriate control account for analysis and reporting purposed.

#### J. Control Account Planning Execution Process

##### 1) Initiation of the Control Account Process

Control account planning can be initiated at any time in which one of the following conditions occurs:

- Project Manager receives notification that he has been given direction to proceed with Up-front Planning and issues a directive to the CAMs to begin planning.
- Conversion of planning packages into work packages due to more current information relating to scope, interfaces, timing, etc., or the imminent initiation of activities associated with the planning package.
- Conversion of planning accounts into control account that consist of appropriate work packages and planning packages.
- Approval of a Baseline Change Proposal (BCP) signifying a change to the Project Budget Baseline (PBB) or the Project Schedule Baseline. The PEP will dictate how the various Class levels shall be handled.
- Approval of a Trend Notice signifying a change to a control account with the approval of the Project Manager.

a) Initiation of the Control Account Planning for New Projects

Approximately three to six months before anticipated project authorization, the Project Manager, with the assistance from Project Controls notifies the responsible CAMs to initiate control account planning.

The CAM will typically be provided the following document to support their pre-planning effort.

- (1) Work Breakdown Structure (WBS)
- (2) WBS Dictionary which describes the scope of work associated with individual control accounts and Identify control account schedule constraints.
- (3) Integrated Project Schedule
- (4) Responsibility Assignment Matrix – with suggested budget targets for each control account
- (5) List of resource codes which will be used to specify resource types and requirements.
- (6) Rate tables (direct and indirect) which will be used to “price out” resource requirements.

The CAM is also notified of special instruction or changes pertinent to the planning effort. Such as the following, this is not meant to be an all inclusive list:

- The need date for completed planning
- Recent funding or schedule changes not reflect in the above documents
- Funding constraints
- Cost activity code to use used during this planning effort.

b) Initiation of the control account planning (replanning) process as a result of approved BCPs

Approved BCPs that impacts either the cost or schedule initiates control account planning (or replanning) for those impacted control accounts. The Project Manager is responsible for notifying the CAMs affected by the approved change.

c) Conversion of Planning Packages to Work Packages and Work Package Replanning

Conversion of Planning Packages - Control Account Plans consist of work packages that designate budgeted and scheduled tasks required to complete the control account scope of work. Budget for control account scope that cannot be planned into work packages is

assigned to planning packages, and may be assigned to a single period within each fiscal year of the control account duration.

It is recommended to maintain between six and nine months of near-term work packages in the cost account. Converting planning packages to work packages normally occurs in quarterly 'rolling-wave' time increments. The Rolling Wave Concept is a continual expansion of scheduling details as time progresses increasing planning for near-term work. This continual review should further define work packages with the most current available information. At a minimum, planning packages must be converted to work packages within one month before the schedule start date of the planning package work scope. In making this conversion, the CAM completes a re-lined mark-up of the CAP defining the new work package (or modifying the old work package) in such areas as resource hours or cost distribution, earned value technique and cost activity codes (if not previously defined). The CAM submits the revised CAP to the Project Manager. After the Project Manager approves the revised CAP, it serves as authorization to make the required conversion.

- 2) The approval of a Trend Change Notification may also initiate the control account planning process. While any associated with a project may initiate a trend notice, these can also be generated when a CAM believes that changes to the control account are warranted to reflect current conditions or future planning. If the overall Control Account budget is not affected and the Control Account Plan continues to support the project baseline, the Project Manager may approve the request and allow the control account to be changed.

### 3) Preparation and Approval of Control Account Plans

Control Account Managers prepare detailed plans containing cost, schedule, and work scope requirements for each control account. This is done on a form called the Control Account Planning Sheet, which is used to display the work packages and planning packages that comprise the control account. The CAM will write and maintain a scope definition for each Work Package which will be an extension of the WBS Dictionary for that Control Account. When defining the packages, CAMs comply with the following work package/planning package guidelines:

- Have discrete beginning and ending events
- Have clear, concise and unambiguous work scope definition consistent with the control account scope as defined by the WBS Dictionary
- Be the responsibility of a single manager, but contain resources from other performing organizations, if necessary
- Have monthly budgets stated in terms of resource codes
- Reflect meaningful work and be oriented as a subdivision of elements in the WBS
- Employ an earned value technique that is consistent with the way the work will be performed and will provide an objective assessment of the Budgeted Cost of Work Performed
- Indicate the earned value or BCWP technique that will be used to assess performance progress
- Reflect the actual way in which work will be done and clearly relate the package to tasks identified in the Functional Intermediate Schedule

- Support milestones and activities shown in, and be consistent with, higher-level schedules; indicate specific relationships to higher-level milestones where one-to-one relationships exist
- Minimize level-of effort work packages

**4) Project Controls Review of CAPs**

Project Controls reviews completed CAPs for consistency with work package and planning package criteria. If necessary, the CAMs incorporate comments from Project Controls. The CAP must be signed by the CAM's manager, if the CAM does not have control over a particular resource needed to accomplish the control account scope. The CAP must be signed by each functional manager who supplies the particular resource.

**5) Approval of Control Account Plans (CAPs)**

Although the CAMs prepare the Control account Plans, the Project Manager has ultimate approval of the plans. This approval is documented by the Project Manager's signature on the CAP. Before signing the CAP, the Project Manager will meet with the CAM and their functional organization manager to resolve and differences with respect to control account work scope, schedule, planned cost, or resource requirements. In addition, Project Controls will provide a quality analysis of the plans before the Project Manager approves the CAPs. Project Controls is, therefore, ensuring that all procedural requirements are met. Some of the more important considerations include ensuring that:

- Work packages are adequately described
- Proper resource codes are used
- Level of effort planning is minimized
- Work package planning exists as far into the future as practical
- Summary work packages supported by subordinate systems (such as EWMS and QURR) are an accurate summary of the detailed planning contained in these systems.
- Schedule Integration is maintained in all levels of planning
- Control account numbers are correct
- Computer outputs reports are accurate reflections of the provided input documents
- Budgets (BCWS and BAC) shown on computer outputs are consistent with targets provided to the CAMs, or if not, the Project Manager is informed.

If the BCWS and the Budget at Completion (BAC) for a given control account are consistent with the constraints placed on the CAM by the Project Manager, the Project Manager signs the CAP to formally approve the CAP. The approved CAPs are returned to the CAMS and represent authorization to begin work on the control account. Copies are sent to Project Controls authorizing the opening of control account numbers and the associated activity charge codes.

The following is a flow for the approval of Control Account Plans (CAPs):

- a) The CAM signs and dates the CAPs
- b) The CAM provides a copy of the PCE for review who ensures that project milestones are appropriately indicated and budget amounts are within the limits.
- c) The CAM seeks and receives approval of his/her functional management
- d) Upon the concurrence of the Project Controls and the Functional Manager, the Project Manager reviews and approves the CAPs by signing and dating the document.

#### 6) Opening and Closing Control Account Numbers

Control Account Numbers are developed during the development of the Project RAM. This is upon, the Project Manager receiving an approved Project Work Authorization (PWA). The control account number is then entered into the Integrated Budget Accounting and Reporting System (IBARS).

The control account number is an eight character alphanumeric designator structured as follows:

Control Account Numbering Scheme - XXXX<sub>1</sub> YYYY<sub>2</sub>  
 XXXX<sub>1</sub> represents the four-digit project number  
 YYYY<sub>2</sub> represents either a code or randomly selected alpha-numeric identifier.

Control account numbers must be opened before an Activity Charge Code and be entered in the cost collection system. Thereby, preventing the actual costs from being accepted, processed and reported through the financial and project reporting system. Project Controls will identify to the WSRC Controller - project contact which control account numbers are to be activated and which should be closed.

When all control account scope has been accomplished, the CAM indicates this during the project statusing cycle. This is approved by the Project Manager and Project Controls begin the control account closing process. An Activity Code Table Maintenance form is prepared to close any remaining Activity Charge Codes that remain open in the cost account. Financial Controls is then responsible for financially closing the control account. Project Controls also assures that the BCWP for the control account equals the BCWS for performance measurement reporting and that the associated activities on the project schedule show 100% complete. The CAM should properly update the CAP as complete. (See CFOD-CLS Homepage, "Business Rules for IBARS Activity Code Table Maintenance" and "Activity Code Closure Reference Guide").

#### 7) Opening and Closing Cost Activity Charge Codes

The Activity Code Table Maintenance form and the associated Type of Work Category (TWC) are forwarded by Project Controls to the project's Financial Controls contact for entry into the appropriate financial databases. An opening date for cost collection is provided on the Maintenance Form. Actual costs are collected against the activity code until the CAM enters another form with the instructions to close the code. Financial Controls processes the instruction required to close the Activity Code in the financial system in the same manner as the code was opened.

If the CAM wants to open additional Activity Codes during the performance of the control account scope, this may be done as long as the control account is open, by processing the additional Activity Code Table Maintenance form with the associated TWC. (See CFOD-CLS Homepage, "Business Rules for IBARS Activity Code Table Maintenance" and "Activity Code Closure Reference Guide")

### 6.0 Analyzing and Reporting Control Account Performance

Both the schedule and the cost performance for control accounts must be incorporated into the projects schedule and cost forecasts. The project schedule should be updated weekly while the projects' cost performance is update monthly. However, it is the PEP or TEP determines the frequency of statusing and reporting of project performance for the various reporting levels.

It is important for the CAM to realize that only schedule analysis (CPM analysis) can determine if work is progressing on the critical path. In other words, through performance measurement analysis the schedule variances and Indicators may indicate a positive schedule performance, while CPM analysis, on the same work scope, indicates negative float. This occurs when schedule tasks on the critical path were not worked, and other less critical tasks were accomplished ahead of schedule. It is important that both schedule and performance measurement analysis be performed to accurately monitor schedule performance.

1. The CAM will status the schedule and provide that data to Project Controls.
2. Project Controls will incorporate each CAMs status into the projects detail schedule.
3. Project Controls will contact the CAM if there is an impact to the project end date and/or major milestone. A work-around plan is developed and incorporated into the schedule. Simultaneously, the Project Manager is contacted and his/her concurrence is received. If a work-around plan cannot be determined, the Project Manager is contacted and Project Controls, the CAM and the PM will determine the path forward. Appropriate communication between the project team members should minimize this type of occurrence. The Plan of the Day meetings should address potential problems and areas of concerns identified by project team members. Corrective actions are identified and incorporated into the project detail schedule. This ensures that all the appropriate parties are duly notified of the required changes. If required, a Trend Notification is initiated.
4. A Critical Path Analysis will be performed by the Project Controls and any areas of future concerns should be written and immediately addressed to the Project Manager. The degree of significance will be evaluated by the Project Manager and if appropriate, an Early Warning document is issued. Or if required, a Trend Notification is initiated.
5. Project Controls provides the control account cost data to the CAMs. This data provides the BCWS, BCWP, ACWP and any variance for current period, cumulative and at-completion per control account. The variance thresholds, as determined by the PEP or TEP, will dictate if a variance analysis is required.
6. If applicable, the CAM writes the variance analysis which is reviewed by the PCE and finally approved by the PM during the reporting process.
7. The Project Controls accumulates all the variance analyses written by the appropriate CAMs, reviews and incorporates the variance analyses into the appropriate format for the required reporting. This data is reviewed and approved by the PM for issuance.

(See the Performance Measurement Guidance document, the Planning & Scheduling document and the Project Trend Program Procedure in E11 for details).

## 7.0 Control Account Performance Analysis

The purposes of Earned Value Management are to discern the long-term performance direction of the project and to forecast its ultimate cost and schedule position, based on actual periodic performance. There are two areas in which the project team needs to focus; 1) schedule performance and 2) cost performance. The performance of any project that employs earned value can be effectively tracked with a focus on the cumulative Schedule Performance Index (SPI) and the Cost Performance Index (CPI) curves. (See WSRC-IM-95-20 Guide 1.9 Performance Analysis and Reporting).

The use of cumulative data versus incremental (monthly or weekly) data is the preferred method when monitoring earned value performance. Incremental data are typically prone to wide

fluctuations caused simply by the placement of planned or actual cost put into the wrong period. However, cumulative data tends to smooth out such variances; providing a more accurate performance trend. Cumulative cost performance data has been demonstrated to be extremely accurate as forecasting tools with earned value projects.

The monitoring of cumulative SPI and CPI performance curves can be an effective project management oversight tool. To improve poor schedule performance, SPI >1.0, a CAM may need to seek additional resources to perform the same amount of budgeted work. The added resources may mean additional people or overtime for an existing work force, or both, may be applied. It's important to recognize this will impact the control account cost performance, CPI. The CAM may need to take an aggressive management style, focusing on the completion of critical path activities, allowing the SPI to recover over time.

As stated, the schedule variance can be improved over time; however, that is not the case for cost variance. The cost variance is normally nonrecoverable for the work performed. If the CAM overruns the costs for completed work, it will likely not be offset by performance on subsequent tasks.

In monitoring project performance, it's important to focus on "exceptions" to the baseline plan; the Project Manager will know exactly when actions must be taken to improve performance for the remaining work. The establishment of variance threshold criteria is primary to monitoring the project's performance effectively. The PEP and/or TEP will depict the variance threshold criteria. At a minimum, cumulative percentage variance criteria with a dollar-limit should be applied against all control accounts. This will focus on control accounts with larger budgets, in which management corrective action will be effective. Threshold criteria should also be established for incremental variances as well, in the same manner as depicted for cumulative variances. This will focus on control account with incremental variance which may have a potential impact on the project at a later date.

EVMS will allow for "early warning" signals to be observed as early as 15 to 20 percent into the project's performance cycle, in time for the Project Manager to take corrective action for all remaining tasks in order to change the final outcome.

## **8.0 Control Account Manager's Notebook**

It is recommended that the CAMs maintain a notebook. This will be useful in combining all the necessary documentation into one location. At a finger-tip, the CAM will be able to identify any scheduling concerns as an impact on a major project milestone, or identify the exact dollar overrun for early receipt of equipment, etc.

At a minimum, the CAM Notebook for the project should consist of:

- 1) PM approval to initiate Control Account Planning
- 8) WBS – highlighting the leg of the Control Accounts under his/her responsibility.
- 9) OBS – highlighting this CAM's organization; from his/her functional management to themselves.
- 10) Project Organizational Chart – highlighting themselves on the chart
- 11) WBS Index - for the entire project
- 12) WBS RAM – for the entire project – highlighting his/her responsible control accounts.

- 13) An abridged version of the WBS Index/RAM displaying the CAMS' responsible control account, work packages and associated cost activity codes.
- 14) Code of Accounts and TWC (if appropriate)– for the entire project
- 15) Approved Cost Activity Code Maintenance Form(s)(copies the original should remain with Financial Controls).
- 16) Detail RAM – which provides brief detail for control accounts; description, budget data and schedule dates, for control account, work packages, and cost activity codes.
- 17) Approved Control Account Plans – Original CAPs signed and dated by the PM and CAM.
- 18) Schedule-Baseline and Current (updated)- includes all the scheduling levels. The detail schedule should be person-loaded for labor and dollar-loaded for equipment and material resources. A list of the project's resource codes should be included. As well as, as list paged by Control Account and work package, of activities and the associated resource loading.
- 19) Approved Estimate – highlighting all Control Accounts this CAM has responsibility. This approved estimate should easily link to the schedule and cost processor to satisfactorily demonstrate agreement between all 3 documents.
- 20) Task Analysis – prepared for estimate
- 21) Current ETC and EAC on Control Accounts
- 22) Current Cost Reports – including latest Cost Performance Report (CPR) formats 1 thru 5 per control account.
- 23) Trend Notifications – Approved, in review, and disapproved status.
- 24) Budget Change Proposals (BCPs) – Approved, in review and disapproved status.
- 25) Undistributed Budget Log – (If appropriate)
- 26) Early Warning Notifications that are prudent to the CAMs control account.

**K. Project Controls CAM Notebook**

The notebook for the Project Control CAM contain the same documents as above, the difference, is that, it is all inclusive for the project; containing the contents for all the control accounts. In addition, the Project Controls notebook should include the Master BCP log for the project.

(FINSIH THIS)

- 1) Project's BCP Log
- 2) Project's Trend Log
- 3) Project's BCP Log

**9.0 References**

- L. WSRC-IM-95-20, Guide 1.8 Schedule Planning and Development (Draft)
- M. 6B Manual, Program Management Manual
- N. E11 Manual, Conduct of Project Management and Control
- O. WSRC-IM-95-20, Guide 1.9 Performance Measurement, Analysis and Reporting (Draft)
- P. WSRC-IM-95-20, Guide 3.3 Project Early Warning Guide

- Q. WSRC-RP-2004-00730 WSRC Earned Value Management System (EVMS) System Description
- R. E7-1, DE-EW Engineering Work Management System (ESMS)
- S. 1E6, CMP-09-04.10 Performance Measurement for Direct Hire Labor
- T. Site Controls Guidance Documents  
[http://shrine.srs.gov/html/psc\\_council/guidancedoc.htm](http://shrine.srs.gov/html/psc_council/guidancedoc.htm)
- U. Fleming, Quentin W. and Koppelman, Joel M., "Earned Value Project Management", 2<sup>nd</sup> Edition, Project Management Institute, Newtown Square, PA, 2000.